Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 to 20. (Cancelled).

21. (Currently Amended) A method for establishing at least a limit value ~~(tmax)~~ for at least a first operational parameter of a nuclear reactor having a core, in which fuel assemblies are loaded, the fuel assemblies having fuel rods each comprising pellets of nuclear fuel and a cladding which surrounds the pellets the method comprising:

simulating at least a transient operational occurrence of the nuclear reactor;

calculating a value reached by a physical quantity during the transient operational occurrence in at least one of the fuel rod cladding; and

establishing as ~~a~~ the limit value, the value of the first operational parameter when the value calculated ~~by~~ for the physical quantity corresponds to a value for the physical quantity which characterizes a failure of the cladding.

22. (Previously Presented) The method according to claim 21, further comprising:

establishing the failure value for the physical quantity which characterizes a failure of the cladding before the step of simulating at least a transient operational occurrence of the nuclear reactor.

23. (Currently Amended) The method according to claim 22, wherein the step of establishing the failure value for the physical quantity which characterizes a failure of the cladding ~~before the step of simulating at least a transient operational occurrence of the nuclear reactor~~ comprises

subjecting the fuel rods to gradients of nuclear power;

calculating the values reached by the physical quantity in at least the cladding which has failed during a power gradient; and

selecting a minimum value from the values reached by the physical quantity.

24. (Previously Presented) The method according to claim 23, wherein the value which characterizes the failure is equal to the minimum value.

25. (Currently Amended) The method according to claim 23, wherein the ~~values~~ value which characterize the failure is equal to the minimum value and corrected by a factor which represents an operating mode of the reactor.

26. (Currently Amended) The method according to claim 21, further comprising:

establishing at least a fuel rod which has a cladding that is the most stressed during the transient occurrence before the step of ~~simulating at least the transient operational occurrence~~ calculating the value reached by the physical quantity during the transient operational occurrence in at least the fuel rod cladding; and

~~that~~ wherein the step of calculating a value reached by a physical quantity during the transient operational occurrence in at least the fuel rod cladding is carried out for ~~one of the and~~ each rod which is established.

27. (Currently Amended) The method according to claim 26, wherein the step of establishing at least a fuel rod which has a cladding that is the most stressed during the transient occurrence ~~before the step of simulating at least the transient operational occurrence~~ comprises the subsidiary steps of:

evaluating the value reached by the physical quantity in the claddings of a plurality of the fuel rods; and

selecting, as the rod whose cladding is the most stressed, the rod that has a highest value of values determined in the step of evaluating the

value reached by the physical quantity in the claddings of a plurality of the fuel rods.

28. (Currently Amended) The method according to claim 21 wherein the first operational parameter is a power per unit length ~~(PLIN)~~ supplied by a fuel rod.

29. (Currently Amended) The method according to claim 21, wherein the first operational parameter is a period of time for operation of the reactor at an intermediate power less than its nominal power ~~(PN)~~.

30. (Previously Presented) The method according to claim 21, wherein the limit value is a limit value for triggering an emergency shutdown of the reactor.

31. (Previously Presented) The method according to claim 30, further comprising:

establishing a limit value for triggering an alarm from the limit value for an emergency shutdown established in the step of establishing as a limit value, the value of the first operational parameter when the value calculated by the physical quantity corresponds to a value for the physical quantity which characterizes a failure of the cladding.

32. (Currently Amended) The method according to claim 21, wherein the step of simulating at least a transient operational occurrence is carried out for at least an operating mode of the reactor selected from the group constituted by:

an operating mode at a total power of the reactor equal to the reactors nominal power,

an extended operating mode at intermediate power, in which the total power of the reactor is less than the reactors nominal power over a period of time of at least 8 hours per period of 24 hours,

a continuous network operating mode, in which the total power varies alternatively around a high power ~~(PN; PE)~~ and around a low power ~~(PR)~~, and

a primary control operating mode, in which the total power of the reactor varies by from 0 to 5% around a reference value between 95 and 100% of the nominal total power of the reactor.

33. (Currently Amended) The method according to claim 32, wherein for at least ~~an~~ the operating mode, the steps of simulating at least a transient operational occurrence of the nuclear reactor; calculating a value reached by a physical quantity during the transient operational occurrence in at least the fuel rod cladding; and establishing as a limit value, the value of the first operational parameter when the value calculated by the physical quantity corresponds to a value for the physical quantity which characterizes a failure of the cladding, are used for another operating mode with, as the failure value of the physical quantity, the failure value of the other operating mode corrected by a corrective value.

34. (Currently Amended) The method according to claim 21, wherein the transient occurrence simulated is a transient occurrence of one of:

an excessive increase in load, an uncontrolled removal of at least a group of control clusters~~,~~ or one of the control clusters falling.

35. (Currently Amended) The method according to claim 21, wherein the physical quantity is one of a stress and a function of ~~stress(es)~~ stress in the cladding.

36. (Previously Presented) The method according to claim 21, wherein the physical quantity is a deformation energy density in the cladding.

37. (Currently Amended) A system for establishing at least a limit value for an operational parameter of a nuclear reactor ~~(2)~~, comprising:

an arrangement to simulate at least a transient operational occurrence of the nuclear reactor;

an arrangement to calculate a value reached by a physical quantity during the transient operational occurrence in at least the fuel rod cladding; and

an arrangement to establish as a limit value, the value of the first operational parameter when the value calculated by the physical quantity corresponds to a value for the physical quantity which characterizes a failure of the cladding.

38. (Previously Presented) The system according to claim 37, characterized in that the system comprises at least a computer and a storage arrangement, in which at least a program for carrying out steps of simulating at least a transient operational occurrence of the nuclear reactor, calculating a value reached by a physical quantity during the transient operational occurrence in at least the fuel rod cladding, and establishing as a limit value, the value of the first operational parameter when the value calculated by the physical quantity corresponds to a value for the physical quantity which characterizes a failure of the cladding is stored.

39. (Currently Amended) An article of manufacture, comprising:

an arrangement configured to perform the steps of a method for establishing at least a limit value ~~(tmax)~~ for at least a first operational parameter of a nuclear reactor having a core, in which fuel assemblies are loaded, the fuel assemblies having fuel rods each comprising pellets of nuclear fuel and a cladding which surrounds the pellets the method comprising, simulating at least a transient operational occurrence of the nuclear reactor, calculating a value reached by a physical quantity during the transient operational occurrence in at least the fuel rod cladding; and establishing as a limit value, the value of the first operational parameter when the value calculated by the physical quantity corresponds to a value for the physical quantity which characterizes a failure of the cladding.

40. (Previously Presented) The article of manufacture according to claim 39, wherein the article of manufacture can be used in a computer.

41. (New) The method according to claim 21, further comprising:

operating the reactor using the limit value, such that failure of the cladding does not occur.